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V.S.

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/907,182    08/06/97    YAMAZAKI

S    07977/023002

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IM62/0521

EXAMINER

DIAMOND, A

ART UNIT

PAPER NUMBER

1753

DATE MAILED:

05/21/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.  
**08/907,182**

Applicant(s)  
**Yamazaki et al.**

Examiner  
**Alan Diamond**

Group Art Unit  
**1753**



☒ Responsive to communication(s) filed on Aug 6, 1997

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 26-80 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 26-80 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☒ received in Application No. (Series Code/Serial Number) 08/623,336

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 08/623,336, filed on 03/27/96.

***Specification***

2. A substitute specification is required pursuant to 37 CFR 1.125(a) because the instant specification contains numerous grammatical errors and is not in proper idiomatic English.

A substitute specification filed under 37 CFR 1.125(a) must only contain subject matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

***Claim Objections***

3. Claims 1, 28, 29, 34 37, 45, 50, 53, 54, 62, 70, and 76 are objected to because of the following informalities: In claim 1, at line 5, the term "catalyst metal containing" should be changed to "catalyst metal-containing". In claim 28, at line 2, the term "said thermally annealing"

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should be changed to "said thermal annealing". In claim 29, at line 2, in claim 37 at line 2, in claim 45 at line 2, in claim 54, at line 2, in claim 62, at line 2, and in claim 70, at line 2, the term "phosphorous silicate glass" should be changed to "phospho-silicate" glass so as to be consistent with the instant parent application. In claim 34, at line 10, the word "functions" should be changed to "function". In claim 50, at line 1, the word "a" should be changed to "an". In claim 53, at lines 1-2, the term "said thermally annealing" should be changed to "said thermal annealing". In claim 76, at lines 11-12, the term "metal containing" should be changed to "metal-containing". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 26-80 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In each of claims 26, 28-34, 36-42, 44-51, 53-59, 61-67, and 69-80, a method of manufacturing "a semiconductor device" is not supported by the specification, as originally filed. The specification as originally filed does provide support for manufacturing a photoelectric

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conversion device, e.g. a solar cell (see, for example, in the originally filed specification, the Field of the Invention at page 1; page 5, lines 4-9). However, a photoelectric conversion device or solar cell is not sufficient support for semiconductor devices in general.

→ In claim 26, at line 3, “an insulating surface” is not supported by the specification, as originally filed. The same applies to dependent claims 27-33.

In claim 26, at line 4, the language “at least part of” is not supported by the specification, as originally filed. The same applies to dependent claims 27-33.

In claim 26, the language “crystallizing said semiconductor film in a way that causes said catalyst metal to diffuse through the semiconductor film and function to promote a crystallization of a material of the semiconductor film” is not supported by the specification, as originally filed. The same applies to dependent claims 27-33. The specification, as originally filed, does teach crystallizing the semiconductor by heating wherein the metal functions to promote the crystallization (see, for example, page 6, lines 1-3; and originally filed claim 1). However, crystallization without the recitation of heat treatment is not supported by the specification, as originally filed.

In claim 26, at line 13, the language “thermally annealing” is not supported by the specification, as originally filed. The same applies to dependent claims 27-33. In particular, claim 28 uses said language at line 2, and claim 31 uses the language “thermal annealing” at lines 1-2.

→ In claim 26, at line 15, the temperature range “not lower than 500°C” is not supported by the specification as originally filed. The same applies to dependent claims 27-33.

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→ In claim 31, the temperature range “not higher than 800°C” is not supported by the specification as originally filed.

In claim 34, the substantially intrinsic semiconductor film doped with boron at a concentration of 0.001-0.1 atm% is not supported by the specification, as originally filed. For example, the last two lines on page 9 of the specification teach that the “amorphous silicon film may be a substantially-intrinsic film or (emphasis added by the Examiner) may contain boron (B) at 0.001 to 0.1 atms%.” However, there is no support for the amorphous silicon film being substantially intrinsic and containing the 0.001-0.1 atm% at the same time. The same applies to dependent claims 35-41.

In claim 34, at line 4, “an insulating surface” is not supported by the specification, as originally filed. The same applies to dependent claims 35-41.

In claim 34, at line 6, the language “at least a part of” is not supported by the specification, as originally filed. The same applies to dependent claims 35-41.

In claim 34, the language “crystallizing said semiconductor film in a way that causes said catalyst metal to diffuse through the semiconductor film and functions to promote a crystallization of said semiconductor film” is not supported by the specification, as originally filed. The same applies to dependent claims 35-51. The specification, as originally filed, does teach crystallizing the semiconductor by heating wherein the metal functions to promote the crystallization (see, for example, page 6, lines 1-3; and originally filed claim 1). However, crystallization without the recitation of heat treatment is not supported by the specification, as originally filed.

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In claim 34, at line 15, the language “thermally annealing” is not supported by the specification, as originally filed. The same applies to dependent claims 35-41. In particular, claims 36 and 41 use the language “thermal annealing” at lines 1-2.

In claim 42, at line 3, “an insulating surface” is not supported by the specification, as originally filed. The same applies to dependent claims 43-50.

In claim 42, at lines 4-5, the language “at least part of” is not supported by the specification, as originally filed. The same applies to dependent claims 43-50.

In claim 42, the language “crystallizing said semiconductor film in a way that causes said catalyst metal to diffuse through the semiconductor film and function to promote a crystallization of said semiconductor film” is not supported by the specification, as originally filed. The same applies to dependent claims 43-50. The specification, as originally filed, does teach crystallizing the semiconductor by heating wherein the metal functions to promote the crystallization (see, for example, page 6, lines 1-3; and originally filed claim 1). However, crystallization without the recitation of heat treatment is not supported by the specification, as originally filed.

In claim 42, at line 13, the language “thermally annealing” is not supported by the specification, as originally filed. The same applies to dependent claims 43-50. In particular, claims 44 and 50 uses the language “thermal annealing” at lines 1-2.

In claim 51, the language “intrinsic to doped junction” at line 2, and the process step of “forming a doped silicon film on said semiconductor film to form an intrinsic to doped junction”

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are not supported by the specification, as originally filed. The same applies to dependent claims 52-58.

In claim 51, at line 4, "an insulating surface" is not supported by the specification, as originally filed. The same applies to dependent claims 52-58.

In claim 51, at lines 5-6, the language "at least part of" is not supported by the specification, as originally filed. The same applies to dependent claims 52-58.

Claim 51 is not supported by specification as originally filed because claim 51 does not recite the presence of phosphorous in the gettering layer. As noted on page 5, lines 16-20, "the gettering layer contains phosphorous ...". The same applies to dependent claims 52, 53, and 56-58.

In claim 51, at line 12, the language "thermally annealing" is not supported by the specification, as originally filed. The same applies to dependent claims 52-58. In particular, claim 53 uses said language at line 2, and claim 56 uses the language "thermal annealing" at lines 1-2.

In claim 51, at line 13, the temperature range "not lower than 500°C" is not supported by the specification as originally filed. The same applies to dependent claims 52-58.

In claim 56, the temperature range "not higher than 800°C" is not supported by the specification as originally filed.

In claim 59, the language "doped to intrinsic junction" at line 2, and the process step of "forming a doped to intrinsic junction using said intrinsic semiconductor film" are not supported by the specification, as originally filed. The same applies to dependent claims 60-66.



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In claim 59, the substantially intrinsic semiconductor film doped with boron at a concentration of 0.001-0.1 atm% is not supported by the specification, as originally filed. For example, the last two lines on page 9 of the specification teach that the “amorphous silicon film may be a substantially-intrinsic film or (emphasis added by the Examiner) may contain boron (B) at 0.001 to 0.1 atms%.” However, there is no support for the amorphous silicon film being substantially intrinsic and containing the 0.001-0.1 atm% at the same time. The same applies to dependent claims 60-66.

In claim 59, at line 4, “an insulating surface” is not supported by the specification, as originally filed. The same applies to dependent claims 60-66.

In claim 59, at line 6, the language “at least partly on” is not supported by the specification, as originally filed. The same applies to dependent claims 60-66.

Claim 59 is not supported by specification as originally filed because claim 59 does not recite the presence of phosphorous in the gettering layer. As noted on page 5, lines 16-20, “the gettering layer contains phosphorous ...”. The same applies to dependent claims 60, 61, and 64-66.

In claim 59, at line 13, the language “thermally annealing” is not supported by the specification, as originally filed. The same applies to dependent claims 60-66. In particular, claims 61 and 66 use the language “thermal annealing” at lines 1-2.

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In claim 67, the language "doped to intrinsic junction" at line 2, and the process step of "forming an intrinsic-to-doped junction on said semiconductor film" are not supported by the specification, as originally filed. The same applies to dependent claims 68-75.

In claim 67, at line 4, "an insulating surface" is not supported by the specification, as originally filed. The same applies to dependent claims 68-75.

In claim 67, at lines 5-6, the language "at least partly on" is not supported by the specification, as originally filed. The same applies to dependent claims 68-75.

Claim 67 is not supported by specification as originally filed because claim 67 does not recite the presence of phosphorous in the gettering layer. As noted on page 5, lines 16-20, "the gettering layer contains phosphorous ...". The same applies to dependent claims 68, 69, and 72-75.

In claim 67, at line 13, the language "thermally annealing" is not supported by the specification, as originally filed. The same applies to dependent claims 68-75. In particular, claims 69 and 75 use the language "thermal annealing" at lines 1-2.

In claim 76, the language "crystallizing said semiconductor film in a way that causes said catalyst metal-containing material to diffuse into at least a part of the semiconductor film, said catalyst metal containing material when so diffused functioning to facilitate said crystallization" is not supported by the specification, as originally filed. The same applies to dependent claims 77-80. The specification, as originally filed, does teach crystallizing the semiconductor by heating wherein the metal functions to promote the crystallization (see, for example, page 6, lines 1-3; and

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originally filed claim 1). However, crystallization without the recitation of heat treatment is not supported by the specification, as originally filed.

In claim 76, the language "forming a further processing layer in contact with said semiconductor film, said further processing layer including a material that reduces a concentration of said catalyst metal-containing material" is not supported by the specification, as originally filed. The specification does provide support for a gettering layer containing phosphorous, but not the use of a generic "processing layer" as here claimed. The same applies to dependent claims 77-80.

In claim 76, the language "processing said semiconductor film and said further processing layer to reduce a concentration of said catalyst metal in said semiconductor film." The same applies to dependent claims 77-80.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 26-80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 26, at line 8, the term "a crystallization" should be changed to "the crystallization" so as to particularly point out the crystallization that is intended. The same applies to dependent claims 27-33.

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In claim 26, it is not clear what is meant by “a material of the semiconductor film” at lines 8-9. It is suggested that “a material of” be deleted. The same applies to dependent claims 27-33.

In claim 34, at line 10, the term “a crystallization” should be changed to “the crystallization” so as to particularly point out the crystallization that is intended. The same applies to dependent claims 35-41.

In claim 42, at line 8, the term “a crystallization” should be changed to “the crystallization” so as to particularly point out the crystallization that is intended. The same applies to dependent claims 43-50.

Claim 51 is indefinite because it is not clear how there can be an intrinsic to doped junction when there is no positively recited intrinsic layer present. The same applies to dependent claims 52-58.

In claim 51, at line 9, the term “a crystallization” should be changed to “the crystallization” so as to particularly point out the crystallization that is intended. The same applies to dependent claims 52-58.

In claim 59, at line 10, the term “a crystallization” should be changed to “the crystallization” so as to particularly point out the crystallization that is intended. The same applies to dependent claims 60-66.

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Claim 67 is indefinite because it is not clear how there can be an intrinsic to doped junction when there is no positively recited intrinsic layer to begin with. The same applies to dependent claims 68-75.

Claim 76 is indefinite because it is not clear exactly where the catalyst metal-containing material is formed. It is not clear exactly where the "forming" step occurs. The same applies to dependent claims 77-80.

Claim 76 is confusing because the language "reduces a concentration of said catalyst metal-containing material" is subjective and indefinite. The concentration is reduced with respect to what and from where is it reduced? The same applies to dependent claims 77-80.

In claim 76, at each of lines 16 and 19, the term "a concentration" should be changed to "the concentration" so as to particularly point out the concentration which is intended. The same applies to dependent claims 77-80.

In claim 79, at lines 2-3, the term "a lower temperature" is indefinite because it is relative and subjective.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

9. Claims 76 and 78-80 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al, U.S. Patent 5,789,284. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15. Furthermore, as noted above in the instant Office action, said claims contain new matter.

Yamazaki et al forms a semiconductor thin film by forming an amorphous silicon film on a glass substrate; dripping nickel acetate solution onto the amorphous silicon film to form a film; crystallizing the amorphous silicon film by heat treatment wherein the nickel (which reads on the instant catalyst metal-containing material) is diffused in the silicon film and facilitates the crystallization; forming an amorphous silicon film (instant further processing (gettering) layer) on the crystallized film; and then heat treating so that the nickel in the crystallized silicon film is dispersed from the crystallized silicon film into the amorphous silicon film (see abstract; col. 1, line 59 through col. 4, line 26; and Embodiments 1, 2, 6, and 9). The amorphous silicon of the amorphous silicon film that is placed on the crystallized silicon film reads on the instant material that reduces the concentration of the catalyst metal-containing material. Since Yamazaki et al teaches the instant process, the reference is deemed to be anticipatory.

10. Claims 76 and 78-80 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al, U.S. Patent 5,529,937.

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Zhang et al prepares a semiconductor device by forming a silicon film on a substrate; introducing a metal element, e.g. nickel, on the silicon film, wherein the metal element promotes crystallization of the silicon film; crystallizing the film; and forming an oxide film on the crystalline silicon film by oxidizing the crystallized silicon film, at for example, 550°C, whereby the metal element in the crystalline silicon film is absorbed into the oxide film by formation of the oxide film.

This reads on the instant forming and processing steps in claim 76 (see abstract; col. 4, lines 33-58; col. 19, line 31 through col. 20, line 36; and claims 1-56). Said oxide film reads on the instant further processing layer. Since Zhang et al teaches the instant process, the reference is deemed to be anticipatory.

11. Claims 76-80 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 6-333824, herein referred to as JP '824.

JP '824 prepares a semiconductor device which includes the steps of forming a phospho-silicate glass (PSG) film (which reads on the instant further processing (gettering) layer on a substrate); forming a foundation film thereon; forming an amorphous silicon film on the foundation; forming a nickel silicon film in contact with part of the amorphous silicon film; crystallizing the amorphous silicon film wherein the nickel is a catalyst for the crystallization; and gettering the nickel with the PSG film (see attached English abstract). Since JP '824 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

12. Claims 76-80 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese patent 5-109737, herein referred to as JP '737.

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See the attached English abstract and Figure 1 of JP '737.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 51-53, 56-61, 64-69, 72-76, and 78-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15. Furthermore, as noted above in the instant Office action, said claims contain new matter.

Yamazaki et al forms a semiconductor thin film by forming an amorphous silicon film on a glass substrate; dripping nickel acetate solution onto the amorphous silicon film to form a film; crystallizing the amorphous silicon film by heat treatment wherein the nickel (which reads on the instant catalyst metal-containing material) is diffused in the silicon film and facilitates the crystallization; forming an amorphous silicon film on the crystallized film; then heat treating so that the nickel in the crystallized silicon film is dispersed from the crystallized silicon film into the amorphous silicon film; and then removing the amorphous silicon film (see abstract; col. 1, line 59 through col. 4, line 39; and Embodiments 1, 2, 6, and 9). The amorphous silicon of the



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amorphous silicon film that is placed on the crystallized silicon film reads on the instant material that reduces the concentration of the catalyst metal-containing material. The heat treatment so that the nickel is dispersed from the crystallized silicon film into the amorphous silicon film is at, for example, 550°C for four hours, or 500°C for two hours (see col 8, lines 29-30; and col. 12, lines 16-18). Yamazaki et al teaches the limitations of the instant claims other than the difference which is discussed below.

Yamazaki et al does not specifically teach forming a doped silicon film on the crystallized silicon film (as per claim 51), forming a doped to intrinsic junction using the crystallized silicon film (as per claim 59), or forming an intrinsic-to-doped junction (as per claim 69). However, these features are convention in the art and are well within the skill of an artisan. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a doped silicon film on the crystallized silicon film (as per claim 51), formed a doped to intrinsic junction using the crystallized silicon film (as per claim 59), or formed an intrinsic-to-doped junction (as per claim 69) because these features are conventional in the art and are well within the skill of an artisan.

15. Claims 51-53, 56-61, 64-69, 72-76, and 78-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al, U.S. Patent 5,529,937.

Zhang et al forms a semiconductor device by forming a silicon film on a substrate; introducing a metal element, e.g. nickel, on the silicon film, wherein the metal element promotes crystallization of the silicon film; crystallizing the film; and forming an oxide film on the crystalline

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silicon film by oxidizing the crystallized silicon film, at for example, 550°C, whereby the metal element in the crystalline silicon film is absorbed into the oxide film by formation of the oxide film. (see abstract; col. 4, lines 33-58; col. 19, line 31 through col. 20, line 36; and claims 1-56). Said oxide film reads on the instant further processing layer. The oxide film can then be removed (see abstract). Zhang et al teaches the limitations of the instant claims other than the difference which is discussed below.

Zhang et al does not specifically teach forming a doped silicon film on the crystallized silicon film (as per claim 51), forming a doped to intrinsic junction using the crystallized silicon film (as per claim 59), or forming an intrinsic-to-doped junction (as per claim 69). However, these features are convention in the art and are well within the skill of an artisan. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a doped silicon film on the crystallized silicon film (as per claim 51), formed a doped to intrinsic junction using the crystallized silicon film (as per claim 59), or formed an intrinsic-to-doped junction (as per claim 69) because these features are conventional in the art and are well within the skill of an artisan.

### ***Double Patenting***

16. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

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F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

17. Claims 26-80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 5,700,333. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method steps recited in the claims render obvious the instant method steps.

18. Claims 51-53, 56-61, 64-69, 72-76, and 78-80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-64 of U.S. Patent No. 5,789,284. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been well within the skill of an artisan to have formed a doped silicon film on the crystallized silicon film (as per claim 51), formed a doped to intrinsic junction using the crystallized silicon film (as per claim 59), or formed an intrinsic-to-doped junction (as per claim 69) as these features are conventional in the art.

19. Claims 51-53, 56-61, 64-69, 72-76, and 78-80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-56 of U.S. Patent No. 5,529,937. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been well within the skill of an artisan to have

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formed a doped silicon film on the crystallized silicon film (as per claim 51), formed a doped to intrinsic junction using the crystallized silicon film (as per claim 59), or formed an intrinsic-to-doped junction (as per claim 69) as these features are conventional in the art.

20. Claims 26-80 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 39-50 and 64-68 of copending Application No. 08/928,750. Although the conflicting claims are not identical, they are not patentably distinct from each other because the additional processing steps in the claims of said copending application, such as patterning and forming a gate electrode, are not excluded by the comprising language in the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

21. Claims 26-80 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the current pending claims of copending Application No. 08/928,740. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of said copending application render obvious the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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*Conclusion*

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schlosser, U.S. Patent 4,561,171 teaches gettering of semiconductor devices.

Yue, U.S. Patent 5,244,819 teaches frontside gettering for removing contamination.

Fonash et al, U.S. Patent 5,275,851 teaches low temperature crystallization and patterning of amorphous silicon films.

Nadahara et al, U.S. Patent 5,360,748 teaches absorbing contaminants into a boron-doped layer.

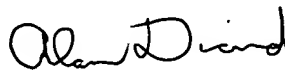
Takayama et al, U.S. Patent 5,501,989 teaches a method of making a semiconductor device/circuit having at least a partially crystallized semiconductor layer.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan D. Diamond whose telephone number is (703) 308-0840. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Alan D. Diamond  
May 20, 1999

  
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